Institutional Determinants of Municipal Fiscal Dynamics*

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Abstract

We characterize how municipal governments respond to economic fluctuations, using employment shocks to capture cyclical movements. We pay particular attention to the role that local fiscal institutions—specifically, Tax and Expenditure Limitations (TELs) on growth in general expenditures or revenues—play in the observed response. We find that in response to a positive employment growth shock of one percent, municipalities facing these limits persistently lag behind their unconstrained counterparts in capital-intensive spending growth, while there is little differential effect on public safety and administrative expenditures. Significant effects on capital outlays persist for two years following a shock, reaching a peak relative reduction in growth of approximately 3.5% per-capita after one year. Transportation and public maintenance spending, in particular, track this pattern and reach maximum relative reductions in growth of roughly 1.7% and 1.5% the year following a shock, respectively, indicating they are absorbing the brunt of the capital response. Relative growth in the total size of government following a shock, however, is only modestly affected. Our findings illuminate a likely unintended consequence of fiscal responsibility measures in U.S. cities: limits designed to restrain the size of government may instead alter the government's spending mix, inducing investment cuts that allow a government to maintain its patterns of administrative and public safety spending.

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1 Introduction

As of 2008, local governments in the United States spend an amount roughly equal to one-eighth of national gross domestic product (GDP)—accounting for one-fourth of total government spending—and employ more than 14 million people (Glaeser, 2013). In light of these facts, it is clear that local governments, and municipal governments in particular, account for a substantial amount of economic activity in the U.S. and their spending and revenue decisions have the potential to affect a large portion of the population. Municipal governments are charged with funding a number of essential services, public goods and capital projects and often face fiscal limitations imposed on them by higher levels of government. It may, therefore, come as a surprise that the existing literature has not explored how these institutional limitations affect cities over the business cycle.

The particular limitations we study are a subset of what are referred to as "Tax and Expenditure Limitations" (henceforth TELs) and are imposed on municipalities by their state of residence. Specifically, we examine limits on growth in general expenditures or general revenues. One example of such a TEL is a limit in New Jersey on general expenditure increases, which states that increases in appropriations are restricted to rise by no more than five percent or the change in the CPI, whichever is smaller and applies to all municipalities within the state. Our analysis aims to help us better understand some of the forces shaping the evolution of city economies over time. In doing so, we provide evidence on whether or not these TELs achieve their desired effect of limiting the size of local governments—a question which has received differing answers in the literature. Beyond this, we also illuminate a likely unintended consequence of these limitations by widening the scope of the analysis to examine the dynamic response of disaggregated spending categories to shocks to local area employment. This allows us to provide a comprehensive examination of how these limitations interact with economic fluctuations, which can be used to both better evaluate the effects of these constraints and inform the design of future fiscal responsibility measures at the local level.

We measure economic fluctuations using instrumented log changes in commuting zone employment, where our instrument stems from the shift-share decomposition of employment growth developed in Bartik (1991). These employment changes are then mapped to municipalities within a given commuting zone. Using these estimates in conjunction with disaggregated municipal spending data, we construct a Jordà (2005) local projections specification to estimate the impact of the aforementioned TELs on municipal fiscal behavior in response to an employment shock contemporaneously and over time. We find that limitations on increases in general expenditures or revenues have strong effects. In response to a positive employment growth shock of one percent, we estimate a large, persistent, negative and statistically significant effect on growth in capital outlays that reaches a peak of roughly -3.5% per-capita one year after a shock. That is, spending growth on capital outlays falls by 3.5% per-capita in TEL-constrained municipalities relative to those unconstrained the year following a shock. A similar pattern emerges for transportation and public maintenance spending—relatively capital-intensive spending categories—suggesting they are absorbing the brunt of the capital response.

There is little differential effect on public safety and administrative expenditures and only a modest negative effect on general expenditures, indicating that TELs do not seem to be constraining the overall size of municipal governments much following an expansionary shock. This finding falls somewhere between that of Kousser, McCubbins and Moule (2008) and those ofearlier studies by Misiolek and Elder (1988), Elder (1992) and Shadbegian (1998). Taken together, our results suggest that broad fiscal responsibility interventions, such as the imposition of limits on general expenditures or revenues, may be ineffective in reducing the size of government. Rather, they may instead prompt governments to reduce investment in order to maintain their current levels of public safety and administrative spending.

A number of early papers sought to characterize the impact of TELS on local finances.[1] However, the effects captured in this literature represent average effects of the implementation of TELs on fiscal variables; how these limitations impact the ability of local governments to respond to economic fluctuations—and the dynamic adjustment induced by the interaction of these two forces—has gone largely unstudied. Buettner and Wildasin (2006) study dynamic municipal government adjustment to fiscal shocks, though no attention is paid to the impact of TELs on adjustment and the analysis focuses on more aggregated fiscal categories. At the state level, Poterba (1994), Bohn and Inman (1996) and Clemens (2012) study the impact of strict balanced-budget requirements on state finances in the face of economic downturns. This literature focuses on describing how state budgets respond to economic fluctuations, given the presence of binding limits (e.g., documenting whether adjustment has occurred largely through the revenue or expenditure side of the budget and what the composition of budget cuts induced by recessionary shocks is). We seek to answer a similar question at the municipal level, though with a decidedly different methodological approach in addition to consideration of expansionary shocks.

The rest of the paper is organized as follows. Section 2 provides the requisite background information on municipal governments and TELs. Section 3 discusses the data used in this project and how we construct the employment shocks mentioned above. Section 4 details

[1] See, for example, Joyce and Mullins (1991), Elder (1992), Mullins and Joyce (1996), Shadbegian (1998), Shadbegian (1999) and Skidmore (1999).

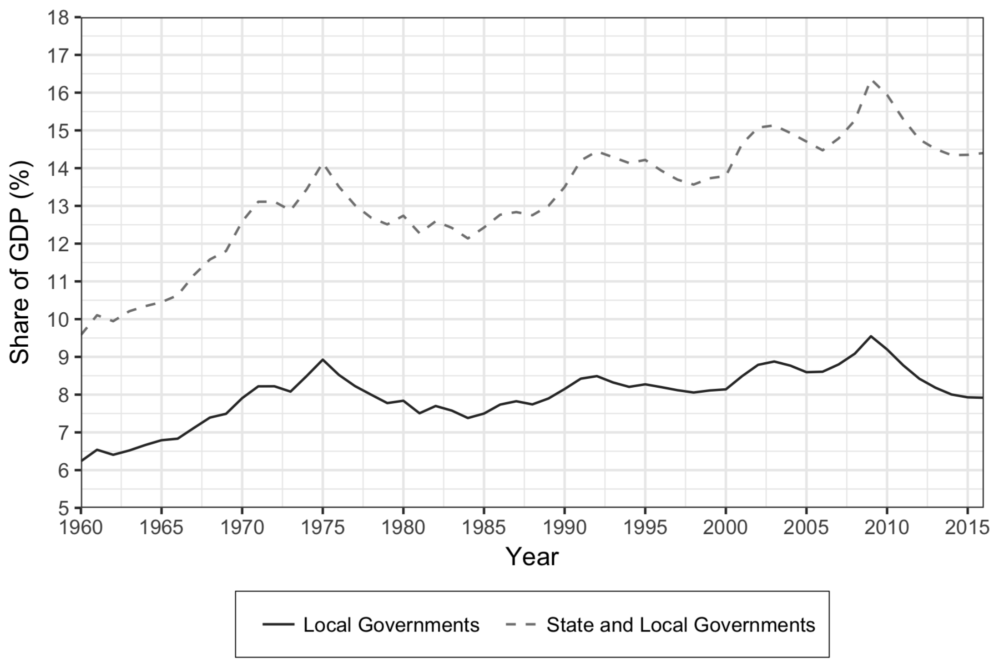
our empirical strategy. Section 5 presents our results and section 6 concludes.

2 Background

2.1 Municipal Governments

We motivated our examination of municipal governments by noting that local government spending amounts to a significant fraction of GDP and that municipal governments feature prominently in this spending total. State and local government spending over time, as a share of GDP, is plotted in Figure 1.[2]

Figure 1: State and Local Government Spending, 1960-2016



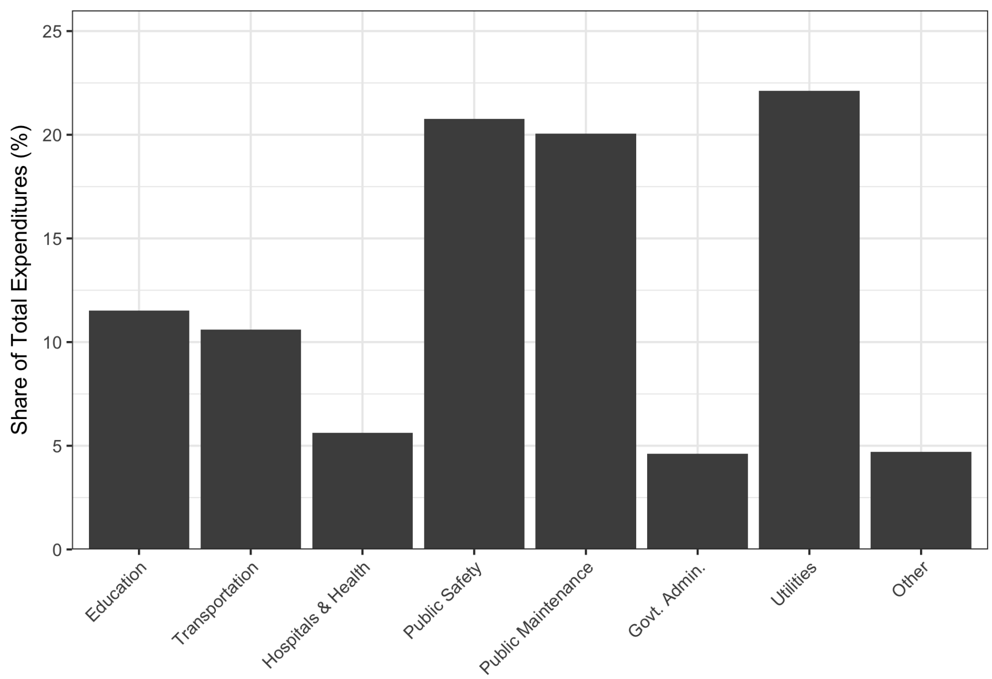
Source: *Federal Reserve Economic Data*, Federal Reserve Bank of St. Louis, 2018

Municipal governments are but one form of local government—the other major forms being county and town governments and school and special districts—so it is worth discussing why we choose to focus on cities as opposed to another form of local government. Our reasons are twofold. First, municipal governments spend and raise more money than any other form of local government. Second, municipal governments are more numerous than are the other forms of local governments and the number of municipalities has been fairly constant over time. Given that municipal governments account for a substantial amount of economic activity, we are particularly concerned with examining how institutional limitations

[2]This figure does not include spending on social welfare.

affect a city's ability to respond to business cycle movements—making our focus on municipal governments a natural one. The particulars of TELs are the focus of the following subsection; here we focus on the functions of municipal governments.

Figure 2: Municipal Government Spending, 2007



Source: *Annual Survey of State and Local Government Finances*, U.S. Census Bureau, 2007

There were 19,492 municipal governments as of 2007, a number that has been relatively stable over the past 50 years. Glaeser (2013) notes that municipal government spending can be broadly grouped into three main categories: basic city services, social welfare spending and education. Examples of basic city services include police, fire and waste management, while social welfare spending includes explicit social welfare spending as well as spending on hospitals and housing services. Virtually all city governments provide basic services like those listed above, but that is not the case for the latter two categories. Large cities tend not to spend much, if at all, on either of these categories—education spending, for instance, often falls under the directive of independent school boards in these places. Another type of spending that we will be especially concerned with in this paper, given the incentives provided by local fiscal institutions, is spending on capital outlays. Capital outlays comprise a portion of spending in many of the categories and examples listed above, but more generally include spending on construction and infrastructure pertaining to highways, buildings and bridges. Specifically, the expenditure categories we study are general expenditures, capital outlays, transportation, public safety, public maintenance and government administration. Figure 2 shows the percentage breakdown of municipal spending by function for 2007, a year in which all city governments were sampled as a part of the Census of Governments.

2.2 Tax and Expenditure Limitations (TELs)

Municipal governments face unique institutional limitations, often imposed on them by higher levels of government. The purpose of these limits is largely to constrain the size of local governments. Much like their state counterparts, city governments often face balanced-budget requirements and are formally restricted from running operating expenditure deficits. Additionally, many municipal governments are limited in their ability to borrow, with these limitations written into their state's constitution. Fiscal restrictions at the municipal level, however, usually take a more disaggregated form relative to state-level measures, where restrictions largely apply to the budget deficit as a whole. Mullins and Wallin (2004) catalogue such restrictions, known as "Tax and Expenditure Limitations" (TELs), drawing on the classification system developed in Joyce and Mullins (1991). The seven basic forms of TELs are listed below; these measures are state policies that apply to all municipalities within the state.

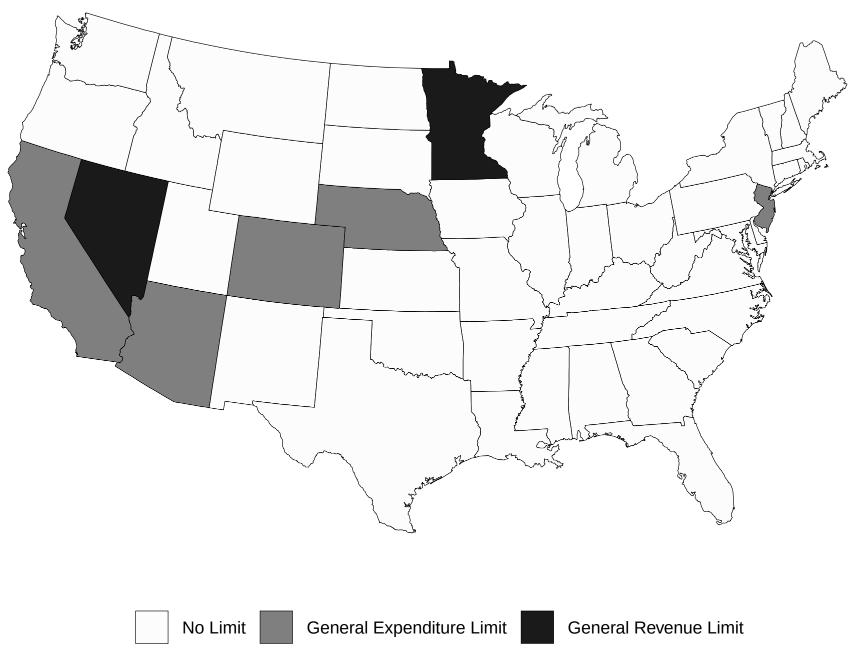
1. Overall property tax rate limits applying to all local governments
2. Specific property tax rate limits applying to specific types o local government (municipalities, counties, school districts, and special districts) or specific functions
3. Property tax levy (revenue) limits
4. General revenue increase limits
5. General expenditure increase limits
6. Limits on assessment increases
7. Full disclosure (truth in taxation)

Oftentimes, an explicit goal of imposing property tax TELs is to diversify revenue streams by inducing a shift in revenue away from property taxes and towards sources such as charges, user fees and utilities.[3] For this reason, we restrict attention to limits on increases in general expenditures and revenues, which more accurately reflect constraints on the government as a whole. In our empirical analysis, we group general expenditure and revenue growth limits

[3]This effect has been documented in a number of studies, including Mullins and Joyce (1996), Shadbegian (1999) and Skidmore (1999).

into one category since they serve similar functions in principle. Figure 3 shows where these limits exist and table 1 provides further information as to when they were put into (and in some cases, taken out of) place. We ignore full disclosure (truth in taxation) since, in practice, this does not represent a binding limitation on municipal governments.

Figure 3: States Implementing General Expenditure and Revenue TELs



Source: Adapted from Mullins and Wallin (2004)

Table 1: States Implementing General Expenditure and Revenue TELs

State	Type of Limit	Passed	Repealed
Arizona	General Expenditure	1921	
California	General Expenditure	1979	
Colorado	General Expenditure	1992	
Minnesota	General Revenue	1971	1993
Nebraska	General Expenditure	1996	
Nevada	General Revenue	1984	1989
New Jersey	General Expenditure	1976	

Source: Adapted from Mullins and Wallin (2004)

3 Data

Annual, disaggregated expenditure data for a large number of U.S. municipalities spanning the years 1974-2004 come via the *Annual Survey of State and Local Government Finances*, courtesy of the U.S. Census Bureau. Annual county-level employment data by both North American Industry Classification System (NAICS) and Standard Industrial Classification (SIC) industry codes for the same time frame also comes from the U.S. Census Bureau, through their data product titled *County Business Patterns*. We follow Autor, Dorn and Hanson (2013) in mapping and aggregating county-level employment data to the corresponding commuting zones.

3.1 Shock Construction

In order to examine how TELs affect municipalities' ability to respond to economic fluctuations, we must first define what we mean by "economic fluctuations." We choose to measure economic fluctuations with changes to the local level of employment. Changes in the local level of employment would undoubtedly be an endogenous regressor in any regression in which a municipal fiscal variable appears as the dependent variable, biasing our estimates. To overcome this problem, we instrument for changes in employment following Bartik (1991). Specifically, the employment growth predictions used to form the instrument can be written as:

$$Bartik_{c,s,t} = \sum_{j} Share_{j,c,s,1974} \times \Delta log(Emp_{j,n,t}) \tag{1}$$

where Emp represents the absolute level of employment, j indexes industries, c indexes commuting zones, s indexes states, t indexes time (annual) and n indicates a national total. We take 1974, the first year of our sample, as the base year and utilize SIC three-digit industry codes when estimating (1). Predicted employment growth in commuting zone c at time t is the sum across industries of national employment growth in each industry at time t, weighted by industry j's share of employment in commuting zone c in 1974. The employment growth prediction is a function of initial industry composition and industry-specific national growth rates. Thus, it removes the idiosyncratic time-varying components of growth. This leaves our employment growth prediction as being a function of the growth predicted by the all-industry national average and industry-specific national growth rates, hence removing the endogenous component of the regressor.[4] We then assign the same commuting zone-level shock to each municipality within a given commuting zone.

[4]This may not be obvious from the structure of equation (1), which is the result of terms canceling in the shift-share decomposition.

Note that in the equation given above, c indexes *commuting zones*, whereas our analysis concerns *municipalities*. Due to data limitations, our Bartik shocks are constructed at the commuting zone level, the reason being that employment data by industry code (a necessary component of the Bartik instrument) do not exist at the municipal level, or any level more disaggregated than the county level. We choose to construct our shocks at the commuting zone-level since we believe commuting zones more accurately describe the relevant labor market, though our results are robust to using county-level shocks.[5]

3.2 Descriptive Statistics

In constructing our final sample, we choose to keep municipalities with no more than two non-surveyed years during our sample period and no more than ten years of missing data in any fiscal category we examine. For municipalities with missing values in one or more fiscal category, we impute values linearly using surrounding years' values. The end result is a "relatively balanced" panel of 1,150 municipalities from 1974-2004; table 2 presents summary statistics for our entire sample for the years 1974 and 2004.[6] The summary statistics for our sample in 2004 align closely with the spending breakdown displayed in figure 2 for the universe of municipal governments in 2007.

General expenditures are defined as "all city expenditure other than the specifically enumerated kinds of expenditure classified as *Utility Expenditure*, *Liquor Stores Expenditure*, and *Employee-Retirement* or other *Insurance Trust Expenditure*." Transportation is the sum of direct expenditures on highways, airports and parking. Public safety is the sum of direct expenditures on police, fire, corrections and protective inspection and regulation. Public maintenance is the sum of direct expenditures on parks and recreation, housing and community development, solid waste management and sewerage. Government administration is the sum of direct expenditures on financial administration, judicial and legal matters and general public buildings. These definitions follow the annual summary report for the *Annual Survey of State and Local Government Finances*, issued by the U.S. Census Bureau.

4 Empirical Strategy

Broadly, our goal is to estimate the effect of local fiscal institutions on municipal governments' response to cyclical movements. Specifically, we examine the effect of general

[5]We follow a similar approach when using county-level shocks; we assign the same county-level shock to each municipality within a given county.

[6]Sample sizes differ slightly from the total number of observations (1,150) when there are missing values that cannot be imputed.

Table 2: Summary Statistics

	N	Mean	Std. Dev.	Min	Max
***Panel 1**: 1974 Summary Statistics*					
Population	1149	75972.68	283806.3	1402	7646818
Exp./Rev. TEL	1150	0.047	0.213	0	1
Spending Variables					
General Expenditures	1149	909.405	695.867	108.438	8554.54
Capital Outlays	1135	207.870	314.486	0.930	8220.699
Transporation	1148	113.759	108.540	8.529	2505.386
Public Maintenance	1145	188.107	160.451	1.112	1643.869
Public Safety	1149	160.330	86.359	0.143	1351.332
Government Administration	1136	33.516	35.463	0.263	427.921
***Panel 2**: 2004 Summary Statistics*					
Population	1086	99401.15	319603.3	1312	8084316
Exp./Rev. TEL	1150	0.135	0.342	0	1
Growth Variables					
CZ Employment Growth	1150	0.011	0.025	-0.162	0.266
Predicted Growth	1150	0.004	0.011	-0.078	0.064
Spending Variables					
General Expenditures	1086	1706.146	2497.151	452.96	73165.72
Capital Outlays	1066	276.510	504.984	0.610	13539.95
Transporation	1086	171.878	217.111	6.093	5594.251
Public Maintenance	1086	330.227	235.43	18.703	3480.346
Public Safety	1085	337.078	175.591	0.056	2751.601
Government Administration	1074	74.625	70.307	0.044	946.524

Notes: Summary statistics for cities in our sample for years 1974 and 2004. Exp./Rev. TEL is an indicator taking value one if a city is limited by a general expenditure or general revenue TEL in that year. All spending variables are in real, per-capita 2004 U.S. dollars. CZ employment growth is the first difference of the natural logarithm of commuting zone employment. Predicted growth is the Bartik growth prediction as defined in equation (1). Note that these quantities are undefined for 1974, as we take that as the base year. Alaska and Hawaii have been excluded from the sample, as are cities with ten or more zero values (which could denote missing data or a true zero) for any spending variable. Remaining zero values are imputed linearly from the surrounding years' values for that city. Any remaining missing values arise when a city did not appear in the sample at all in that year. Values for these years were not imputed.

expenditure and revenue TELs on disaggregated city spending categories in response to a local employment shock. The question our statistical model speaks to is, what is the differential response in growth in a given spending category following a shock to local area employment growth between a municipality subject to a limit on increases in general expenditures or revenues and one which is not? Our baseline specification draws on the local projections method formulated in Jordà (2005) and used similarly in Leduc and Wilson (2013). Our estimating equation is given by:

$$
\begin{aligned}
\log(y_{i,c,s,t+h}) - \log(y_{i,c,s,t-1}) =& \alpha_i^h + \alpha_t^h + \sum_{q=1}^{p+1} \beta_q^h \log(y_{i,c,s,t-q}) \\
&+ \delta_1^h 1\{TEL_{s,t}\} + \delta_2^h \Delta \log(\widehat{Emp}_{c,s,t}) \\
&+ \delta_3^h 1\{TEL_{s,t}\} \times \Delta \log(\widehat{Emp}_{c,s,t}) + \varepsilon_{i,c,s,t+h},
\end{aligned} \tag{2}
$$

where $y_{i,c,s,t}$ is per-capita spending in a category y in municipality i in commuting zone c in state s at time t. t indexes years and $h = 0, 1, \ldots, 5$ denotes the horizon of the forecast. The expenditure categories we examine are general expenditures, capital outlays, transportation, public safety, public maintenance and government administration. $\Delta \log(\widehat{Emp}_{c,s,t})$ is the instrumented log change in commuting zone employment, where employment growth is instrumented for using $Bartik_{c,s,t}$ as in equation (1) in our first-stage. $1\{TEL_{s,t}\}$ equals one if state s has a general expenditure or revenue TEL at time t and zero otherwise. We set $p = 2$ and cluster standard errors at the commuting zone level. α_i^h and α_t^h are municipality and year fixed-effects, respectively.

Our coefficient of interest is δ_3^h; its interpretation is the following. If employment growth increases by one percent at time t, spending growth in category y in a TEL-constrained municipality changes by δ_3^h percent relative to a municipality without either TEL at horizon h—i.e., spending growth in category y in a municipality with a general expenditure or revenue TEL is δ_3^h percent higher/lower than that in a municipality without one h years after the shock. At horizon $h = 0$, this model reduces to a fairly standard static specification. For $h = 1, \ldots, 5$, this model produces forecasts of the effect of a shock to employment growth at time t on category y at time $t+h$, conditional on information through time t. Plotting δ_3^h for $h = 0, 1, \ldots, 5$ therefore provides impulse responses for the relative effect of the shock across municipalities with and without general expenditure or revenue TELs on impact through five years afterwards. We feel that it is crucial to examine dynamic effects for a complete analysis of how institutional limitations affect municipalities—only by doing so can we get a sense of how institutions influence these governments' behavior over the business cycle. By coupling dynamic analysis with disaggregation, our estimation strategy allows us to see precisely where the shocks are felt within constrained governments, in addition to the magnitude and persistence of the effects.

5 Results

5.1 Main Results

This section presents estimates from the baseline specification given in equation (2). The spending categories we examine are general expenditures, capital outlays, transportation, public maintenance, public safety and government administration. Coefficient estimates and standard errors are reported in table 10. Our coefficient of interest is δ_3^h, which corresponds to the coefficient on the variable TEL$\times\Delta log(Emp)$ in the table. Figure 4 plots the impulse response coefficients δ_3^h for $h = 0, 1, \ldots, 5$, along with accompanying 90% confidence bands.

Our results show that following a positive shock to employment growth of one percent, growth in general expenditures in municipalities faced with a limit on increases in general expenditures or revenues only modestly falls behind that in municipalities with no such limits. This indicates that TELs do not seem to be constraining the size of municipal governments much following an expansionary shock, which contributes to the outstanding debate on whether or not TELs achieve their intended effect of constraining the size of local governments. Specifically, general expenditures growth falls by 0.815% in constrained municipalities relative to unconstrained municipalities one year after a shock, but rebounds to grow 0.343% quicker four years following a shock. The latter result may reflect "catch up" spending that occurs once the binding constraint has slackened.

There are two primary takeaways from our findings for the disaggregated spending categories listed above. First, there is by and large no differential effect on public safety and administrative expenditures. The only significant result at any horizon for either of these two categories is the 0.585% relative increase in administrative spending growth four years after an initial shock. The timing of this effect comports with the result for general expenditures and is again likely reflective of catch up spending occurring once the constraint has

Table 3: Baseline Results

	$h = 0$	$h = 1$	$h = 2$	$h = 3$	$h = 4$	$h = 5$
***Panel 1**: Expenditures*						
$\Delta log(Emp)$	-0.189	-0.237	-0.011	0.044	0.410**	0.565***
	(0.155)	(0.154)	(0.131)	(0.175)	(0.192)	(0.162)
TEL × $\Delta log(Emp)$	-0.340*	-0.815***	-0.410*	-0.078	0.343**	-0.020
	(0.184)	(0.292)	(0.214)	(0.214)	(0.169)	(0.258)
TEL	0.037*	0.070***	0.078***	0.076***	0.073***	0.093***
	(0.020)	(0.024)	(0.021)	(0.023)	(0.027)	(0.035)
N	34153	33003	31853	30703	29553	28403
***Panel 2**: Capital Outlays*						
$\Delta log(Emp)$	-0.148	-0.280	1.067**	-0.087	0.130	1.663***
	(0.496)	(0.506)	(0.526)	(0.569)	(0.651)	(0.498)
TEL × $\Delta log(Emp)$	-2.406***	-3.527***	-2.515***	-0.248	1.073*	0.309
	(0.631)	(0.784)	(0.756)	(0.702)	(0.551)	(0.621)
TEL	0.126***	0.198***	0.185***	0.128**	0.112**	0.137***
	(0.025)	(0.036)	(0.049)	(0.050)	(0.047)	(0.050)
N	33971	32821	31671	30521	29371	28221
***Panel 3**: Transportation*						
$\Delta log(Emp)$	-0.217	-0.098	0.241	0.577**	0.323	0.756***
	(0.212)	(0.238)	(0.277)	(0.264)	(0.530)	(0.285)
TEL × $\Delta log(Emp)$	-0.320	-1.672***	-1.465***	-0.427*	0.227	-0.019
	(0.261)	(0.465)	(0.355)	(0.253)	(0.318)	(0.269)
TEL	0.026*	0.089***	0.096***	0.086***	0.075***	0.086***
	(0.014)	(0.027)	(0.030)	(0.028)	(0.024)	(0.027)
N	34148	32998	31848	30698	29548	28398

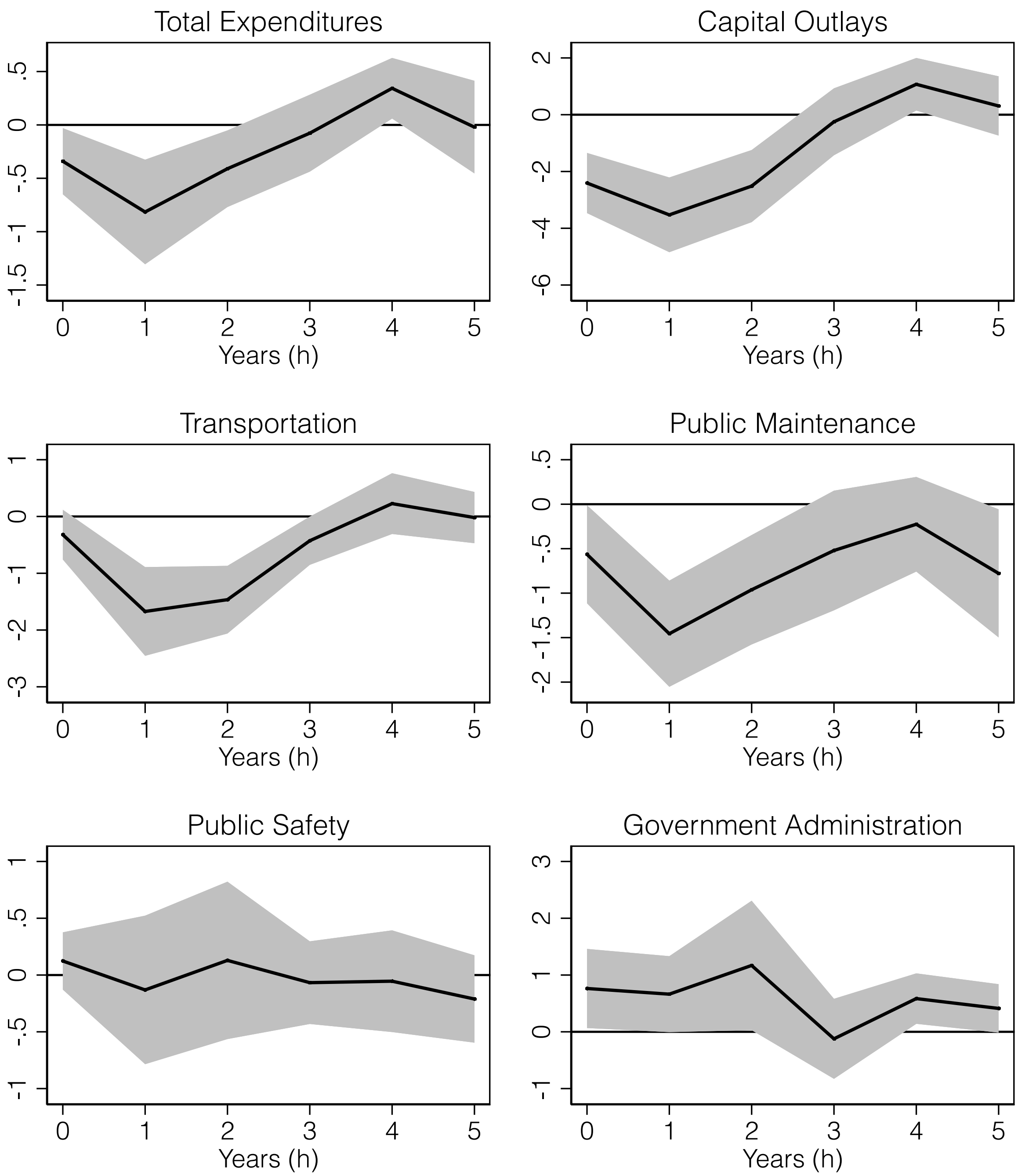
Notes: Dependent variables are given by each panel heading. Units of all dependent variables are real, per-capita 2004 U.S. dollars. h represents the forecast horizon, as outlined in equation (2). TEL is an indicator taking value one if a city faces a general expenditure or general revenue TEL during the year in which the shock occurs. *Emp* is employment in the commuting zone in which a city resides. Municipality and year fixed effects omitted. Standard errors are clustered at the commuting zone level and presented in parentheses. Significance levels: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table 3 (Cont.): Baseline Results

	$h=0$	$h=1$	$h=2$	$h=3$	$h=4$	$h=5$
***Panel 4**: Public Maintenance*						
$\Delta log(Emp)$	-0.412	-0.258	-0.285	-0.227	0.684***	0.411
	(0.261)	(0.273)	(0.295)	(0.303)	(0.264)	(0.252)
TEL × $\Delta log(Emp)$	-0.563*	-1.456***	-0.962***	-0.521	-0.225	-0.778*
	(0.328)	(0.355)	(0.366)	(0.400)	(0.317)	(0.429)
TEL	0.051***	0.096***	0.095**	0.090**	0.099**	0.131***
	(0.016)	(0.026)	(0.039)	(0.046)	(0.043)	(0.037)
N	34132	32982	31832	30682	29532	28382
***Panel 5**: Public Safety*						
$\Delta log(Emp)$	-0.053	0.019	0.151	0.232*	0.507***	0.252
	(0.126)	(0.126)	(0.114)	(0.134)	(0.166)	(0.177)
TEL × $\Delta log(Emp)$	0.124	-0.131	0.129	-0.067	-0.054	-0.211
	(0.150)	(0.389)	(0.412)	(0.217)	(0.267)	(0.229)
TEL	0.006	0.020	0.019	0.031*	0.037*	0.046***
	(0.013)	(0.018)	(0.020)	(0.016)	(0.019)	(0.017)
N	34137	32987	31837	30687	29537	28387
***Panel 6**: Government Administration*						
$\Delta log(Emp)$	0.156	0.411	0.280	0.617**	0.791***	0.560*
	(0.291)	(0.295)	(0.280)	(0.265)	(0.275)	(0.294)
TEL × $\Delta log(Emp)$	0.763*	0.663*	1.169*	-0.123	0.585**	0.412
	(0.415)	(0.398)	(0.679)	(0.419)	(0.265)	(0.254)
TEL	-0.046	-0.048	-0.060	-0.031	-0.054	-0.043
	(0.044)	(0.059)	(0.072)	(0.066)	(0.056)	(0.057)
N	34020	32870	31720	30570	29420	28270

Notes: Dependent variables are given by each panel heading. Units of all dependent variables are real, per-capita 2004 U.S. dollars. h represents the forecast horizon, as outlined in equation (2). TEL is an indicator taking value one if a city faces a general expenditure or general revenue TEL during the year in which the shock occurs. *Emp* is employment in the commuting zone in which a city resides. Municipality and year fixed effects omitted. Standard errors are clustered at the commuting zone level and presented in parentheses. Significance levels: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Figure 4: Baseline Results - Impulse Response Functions



Notes: Impulse response functions for δ_3^h, as specified by equation (2). The x-axis represents the forecast horizon h, *i.e.*, the number of years following an employment shock. Point estimates are represented by the thick black line, with 90 percent confidence bands represented by the shaded gray area.

slackened, particularly given the nature of the shock we consider.[7] Second, capital-related spending in municipalities facing a general expenditure or revenue TEL falls substantially and persistently relative to spending in municipalities without either of these limits. Significant effects on capital outlays persist for two years following a shock, reaching a peak relative reduction in growth of 3.527% per-capita after one year. Transportation and public maintenance expenditures—two capital-intensive spending categories—track this pattern, indicating they are absorbing the bulk of the capital response. Maximum relative reductions in transportation and public maintenance spending growth are 1.672% and 1.456% per-capita, respectively; both occur one year after a shock.

5.2 Threats to Identification

In this section, we outline two potential threats to identification and present evidence that neither is a concern in our case. First, the implementation of a TEL is potentially endogenous. Specifically, state governments may respond to large increases in local government expenditures by passing a TEL in order to curb what they consider to be "out of control" spending. This would introduce bias into our estimates.

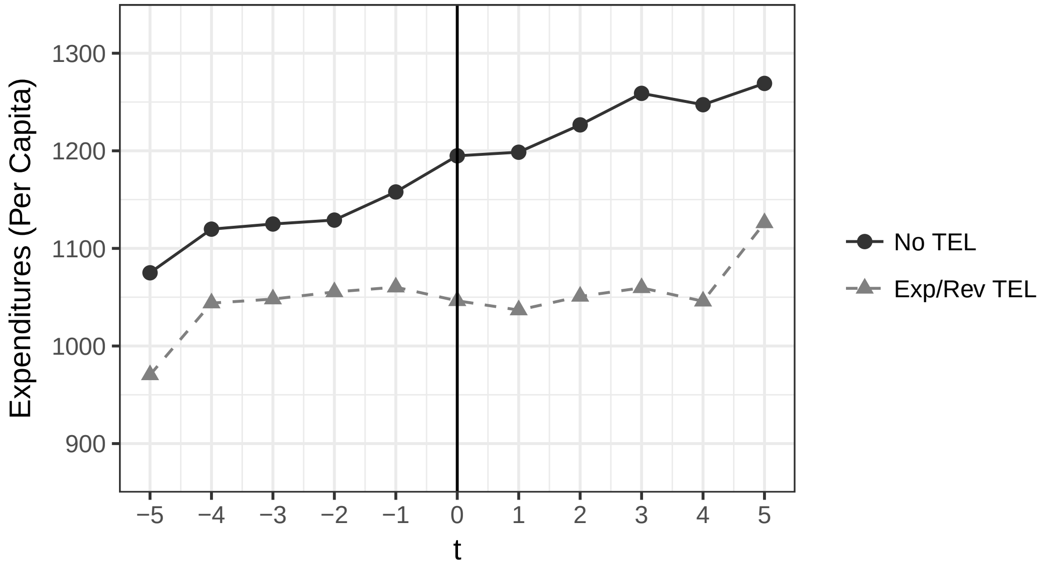
To address this concern, we compare spending patterns of municipalities in states implementing general expenditure or general revenue TELs with those in states that do not in the years immediately before and after the limits are passed. Figure 5 plots average per-capita expenditures for municipalities in TEL-implementing states and in other states in order to examine expenditure trends surrounding the five TELs passed during our sample period.[8] The x-axis represents the number of years before or after the implementation of a TEL, with $t = 0$ being the year of implementation. This figure shows clear parallel trends in expenditures between the two groups. Only when the TEL is implemented do the trends begin to diverge. This shows that, on average, states do not respond specifically to upticks in spending by local governments by passing TELs, and that before TELs are passed, the dynamics of municipal spending are similar in TEL and non-TEL states.

An additional concern is that local governments in TEL states receive systematically different shocks than those in non-TEL states. Particularly, we might be concerned that because there are more non-TEL states than TEL states, the distribution of shocks between these groups differs, either from an underlying difference in the economies of the states within

[7]If administrative staffing and spending roughly follow a step-function based on population, per-capita administrative spending would be expected to increase following a positive shock to employment growth. This could appear as a significant relative increase in administrative spending at longer horizons if initial desired spending increases must be postponed due to the presence of a binding constraint on increases in general expenditures or revenues.

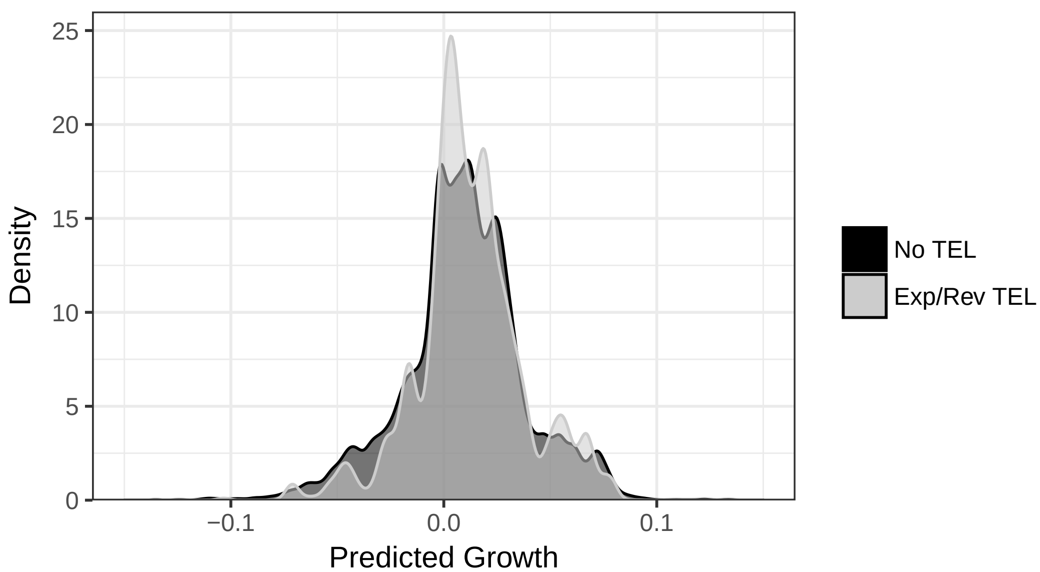
[8]These are the TELs passed in 1976, 1979, 1984, 1992 and 1996.

Figure 5: Comparison of Trends



Notes: Average per-capita expenditures for municipalities in states implementing general expenditure or general revenue TELs (gray dashed lines and triangles) and municipalities in all other states (black solid lines and points). The x-axis represents the number of years before or after a TEL is implemented.

Figure 6: Comparison of Shock Densities



Notes: Overlaid densities of predicted growth (calculated according to equation (1)) in states with (light, in front) and without (dark, behind) general expenditure or general revenue TELs.

those groups, or simply as a consequence of the few observations for TEL-states. In either case, our estimates could be biased. To test for this, in figure 6 we plot the distribution of growth predictions, as calculated by equation (1), for municipalities in states with general expenditure or general revenue TELs (blue) and those in states without TELs (red). The distributions are overlaid so that they may be more easily compared. The general shapes, centers and spreads of the two distributions align closely. The distribution for TEL states is more uneven, but this is likely attributable to the sample size. This figure should confirm that, on average, TEL-facing municipalities and their counterparts in other states face similar shocks.

6 Conclusion

Municipal governments account for a substantial amount of economic activity in the United States and are entrusted with funding a number of essential services, public goods and capital projects. Furthermore, they often face fiscal limitations imposed on them by higher levels of government. In this paper, we study how limits on general expenditures or revenues growth affect cities in response to business cycle movements. These limits are state-level policies that apply to all municipalities within a state and comprise a subset of what are referred to more generally as "Tax and Expenditure Limitations" (TELs).

We measure economic fluctuations using instrumented log changes in commuting zone employment, drawing on the methodology developed in Bartik (1991). We then use these estimates, along with disaggregated municipal spending data, to formulate a local projections impulse response specification to study the effect these limits have on municipalities in response to an employment shock within-period and over time. Our findings are summarized as follows. Following an expansionary shock, the overall size of municipal governments (as measured by general expenditures) faced with one of these limits grows only slightly more slowly than it does in those without either limit. Moreover, we find largely no differential effect for public safety and administrative expenditures. The primary effect of the TELs is on capital spending; cities faced with general expenditure or revenue TELs lag substantially and persistently behind their unconstrained counterparts in capital outlays growth following a positive shock to employment growth. Relative reductions in capital outlays occur predominantly through transportation and public maintenance expenditures, specifically.

TELs are fiscal responsibility measures intended to constrain the size of local governments. What we have shown in this paper is that the most restrictive of these limits are only moderately successful in doing so. Rather, as the economy expands, such limits appear to induce reductions in public investment in order to sustain prior levels of public safety and administrative spending. We hope our findings will be used to inform the design of future fiscal responsibility measures at the local level. Our results suggest that targeting aggregate expenditure or revenue categories may lead to potentially undesirable changes in the underlying spending mix. As a result, directing these limits instead towards more disaggregated spending categories may prove to be more effective in achieving the underlying policy intent. One possibility would be coupling a limit on general expenditure increases with an explicit limit on increases in administrative spending.

References

Autor, David H., David Dorn, and Gordon H. Hanson. 2013. "The China Syndrome: Local Labor Market Effects of Import Competition in the United States." *American Economic Review*, 103(6): 2121–68.

Bartik, Timothy J. 1991. *Who Benefits from State and Local Economic Development Policies?* Kalamazoo, M:W.E. Upjohn Institute for Employment Research.

Bohn, Henning, and Robert P. Inman. 1996. "Balanced-Budget Rules and Public Deficits: Evidence from the U.S. States." *Carnegie-Rochester Conference Series on Public Policy*, 45: 13–76.

Buettner, Thiess, and David E. Wildasin. 2006. "The dynamics of municipal fiscal adjustment." *Journal of Public Economics*, 90(6): 1115–1132.

Clemens, Jeffrey. 2012. "State Fiscal Adjustment During Times of Stress: Possible Causes of the Severity and Composition of Budget Cuts." `https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2170557` (Accessed 2018-04-29).

Elder, Harold W. 1992. "Exploring the Tax Revolt: an Analysis of the Effects of State Tax and Expenditure Limitation Laws." *Public Finance Review*, 20(1): 47–63.

Glaeser, Edward L. 2013. "Chapter 4 - Urban Public Finance." In *Handbook of Public Economics*. Vol. 5, 195–256.

Jordà, Òscar. 2005. "Estimation and Inference of Impulse Responses by Local Projections." *American Economic Review*, 95(1): 161–182.

Joyce, Philip G., and Daniel R. Mullins. 1991. "The Changing Fiscal Structure of the State and Local Public Sector: The Impact of Tax and Expenditure Limitations." *Public Administration Review*, 51(3): 240.

Kousser, Thad, Matthew D. McCubbins, and Ellen Moule. 2008. "For Whom the TEL Tolls: Can State Tax and Expenditure Limits Effectively Reduce Spending?" *State Politics & Policy Quarterly*, 8(4): 331–361.

Leduc, Sylvain, and Daniel Wilson. 2013. "Roads to Prosperity or Bridges to Nowhere? Theory and Evidence on the Impact of Public Infrastructure Investment." *NBER Macroeconomics Annual*, 27(1): 89–142.

Misiolek, Walter S., and Harold W. Elder. 1988. "Tax Structure and the Size of Government: An Empirical Analysis of the Fiscal Illusion and Fiscal Stress Arguments." *Public Choice*, 57(3): 233–245.

Mullins, Daniel R., and Bruce A. Wallin. 2004. "Tax and Expenditure Limitations: Introduction and Overview." *Public Budgeting & Finance*, 24(4): 2–15.

Mullins, Daniel R., and Philip G. Joyce. 1996. "Tax and Expenditure Limitations and State and Local Fiscal Structure: An Empirical Assessment." *Public Budgeting & Finance*, 16(1): 75–101.

Poterba, James M. 1994. "State Responses to Fiscal Crises: The Effects of Budgetary Institutions and Politics." *Journal of Political Economy*, 102(4): 799–821.

Shadbegian, Ronald J. 1998. "Do Tax and Expenditure Limitations Affect Local Government Budgets? Evidence From Panel Data." *Public Finance Review*, 26(2): 118–136.

Shadbegian, Ronald J. 1999. "The Effect of Tax and Expenditure Limitations on the Revenue Structure of Local Government, 1962-87." *National Tax Journal*, 52(2): 221–237.

Skidmore, Mark. 1999. "Tax and Expenditure Limitations and the Fiscal Relationships between State and Local Governments." *Public Choice*, 99(1): 77–102.

Appendix A Additional Results

Table 5: First Stage Results

	(1) $\Delta log(Emp)$	(2) $\Delta log(Emp)$	(3) $\Delta log(Emp)$	(4) $\Delta log(Emp)$
Bartik	0.887***	0.677***	0.893***	0.663***
	(0.044)	(0.121)	(0.045)	(0.138)
Year FE	No	Yes	No	Yes
Muni FE	No	No	Yes	Yes
Observations	34500	34500	34500	34500
Adjusted R^2	0.353	0.379	0.374	0.402
F	410.64	31.19	388.19	23.16

Notes: Entries are coefficients from first-stage regressions. In all cases, the dependent variable is the actual change in log commuting zone employment and independent variables are the predicted change in log employment, calculated according to (1), and fixed effects, if any. Fixed effects coefficients are omitted. Standard errors, clustered at the commuting zone level, are presented in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$ *** $p < 0.01$

Table 6: Ordinary Least Squares Results (Reduced Form)

	$h = 0$	$h = 1$	$h = 2$	$h = 3$	$h = 4$	$h = 5$
***Panel 1**: Expenditures*						
$\Delta log(Emp)$	-0.089**	-0.022	0.080*	0.135***	0.243***	0.299***
	(0.037)	(0.044)	(0.047)	(0.050)	(0.051)	(0.052)
TEL $\times$ $\Delta log(Emp)$	-0.261**	-0.495**	-0.317*	-0.007	0.025	-0.037
	(0.111)	(0.216)	(0.173)	(0.141)	(0.116)	(0.129)
TEL	0.035*	0.062***	0.075***	0.074***	0.083***	0.094***
	(0.018)	(0.021)	(0.021)	(0.024)	(0.027)	(0.031)
N	34153	33003	31853	30703	29553	28403
***Panel 2**: Capital Outlays*						
$\Delta log(Emp)$	-0.172	0.262*	0.483***	0.609***	0.636***	0.918***
	(0.136)	(0.140)	(0.150)	(0.157)	(0.162)	(0.173)
TEL $\times$ $\Delta log(Emp)$	-1.336***	-1.794***	-0.994**	0.326	0.680	0.162
	(0.399)	(0.563)	(0.418)	(0.503)	(0.691)	(0.591)
TEL	0.097***	0.150***	0.143***	0.110**	0.124**	0.141***
	(0.024)	(0.034)	(0.045)	(0.047)	(0.049)	(0.048)
N	33971	32821	31671	30521	29371	28221
***Panel 3**: Transportation*						
$\Delta log(Emp)$	-0.068	0.036	0.362***	0.526***	0.437***	0.525***
	(0.068)	(0.079)	(0.093)	(0.111)	(0.096)	(0.095)
TEL $\times$ $\Delta log(Emp)$	-0.074	-0.723**	-0.740**	0.024	0.176	0.212
	(0.206)	(0.350)	(0.310)	(0.221)	(0.237)	(0.211)
TEL	0.019	0.063**	0.076**	0.073**	0.076***	0.079***
	(0.014)	(0.026)	(0.031)	(0.029)	(0.023)	(0.022)
N	34148	32998	31848	30698	29548	28398

Notes: Dependent variables are given by each panel heading. Units of all dependent variables are real, per-capita 2004 U.S. dollars. h represents the forecast horizon, as outlined in equation (2). TEL is an indicator taking value one if a city faces a general expenditure or general revenue TEL during the year in which the shock occurs. *Emp* is employment in the commuting zone in which a city resides. Municipality and year fixed effects omitted. Standard errors are clustered at the commuting zone level and presented in parentheses. Significance levels: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table 6 (Cont.): Ordinary Least Squares Results (Reduced Form)

	$h=0$	$h=1$	$h=2$	$h=3$	$h=4$	$h=5$
***Panel 4**: Public Maintenance*						
$\Delta log(Emp)$	-0.171**	-0.069	-0.051	0.063	0.152**	0.359***
	(0.068)	(0.078)	(0.081)	(0.084)	(0.077)	(0.077)
TEL × $\Delta log(Emp)$	-0.460**	-0.751***	-0.554**	-0.244	-0.059	-0.324
	(0.192)	(0.223)	(0.258)	(0.298)	(0.285)	(0.286)
TEL	0.049***	0.077**	0.083**	0.081*	0.094**	0.117***
	(0.018)	(0.030)	(0.039)	(0.044)	(0.045)	(0.043)
N	34132	32982	31832	30682	29532	28382
***Panel 5**: Public Safety*						
$\Delta log(Emp)$	-0.051*	0.012	0.156***	0.162***	0.219***	0.201***
	(0.031)	(0.037)	(0.039)	(0.047)	(0.054)	(0.055)
TEL × $\Delta log(Emp)$	-0.041	-0.215	-0.051	-0.030	-0.291**	-0.225
	(0.170)	(0.343)	(0.296)	(0.212)	(0.130)	(0.146)
TEL	0.010	0.022	0.024	0.030*	0.044***	0.046***
	(0.013)	(0.017)	(0.018)	(0.018)	(0.016)	(0.016)
N	34137	32987	31837	30687	29537	28387
***Panel 6**: Government Administration*						
$\Delta log(Emp)$	-0.068	0.036	0.362***	0.526***	0.437***	0.525***
	(0.068)	(0.079)	(0.093)	(0.111)	(0.096)	(0.095)
TEL × $\Delta log(Emp)$	-0.074	-0.723**	-0.740**	0.024	0.176	0.212
	(0.206)	(0.350)	(0.310)	(0.221)	(0.237)	(0.211)
TEL	0.019	0.063**	0.076**	0.073**	0.076***	0.079***
	(0.014)	(0.026)	(0.031)	(0.029)	(0.023)	(0.022)
N	34148	32998	31848	30698	29548	28398

Notes: Dependent variables are given by each panel heading. Units of all dependent variables are real, per-capita 2004 U.S. dollars. h represents the forecast horizon, as outlined in equation (2). TEL is an indicator taking value one if a city faces a general expenditure or general revenue TEL during the year in which the shock occurs. *Emp* is employment in the commuting zone in which a city resides. Municipality and year fixed effects omitted. Standard errors are clustered at the commuting zone level and presented in parentheses. Significance levels: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table 8: Baseline Results (Counties)

	$h = 0$	$h = 1$	$h = 2$	$h = 3$	$h = 4$	$h = 5$
***Panel 1**: Expenditures*						
$\Delta log(Emp)$	0.027	-0.228	-0.017	-0.083	0.247	0.152
	(0.128)	(0.158)	(0.175)	(0.218)	(0.211)	(0.166)
TEL $\times$ $\Delta log(Emp)$	-0.295*	-0.650***	-0.371*	0.047	0.440***	0.184
	(0.156)	(0.215)	(0.204)	(0.183)	(0.169)	(0.174)
TEL	0.037***	0.068***	0.078***	0.072***	0.069***	0.086***
	(0.010)	(0.013)	(0.017)	(0.019)	(0.020)	(0.021)
N	34153	33003	31853	30703	29553	28403
***Panel 2**: Capital Outlays*						
$\Delta log(Emp)$	0.821*	-0.327	1.019*	-0.384	0.552	0.947**
	(0.442)	(0.433)	(0.546)	(0.547)	(0.496)	(0.435)
TEL $\times$ $\Delta log(Emp)$	-2.236***	-2.917***	-2.307***	0.183	1.258**	0.789**
	(0.514)	(0.582)	(0.685)	(0.505)	(0.565)	(0.402)
TEL	0.131***	0.191***	0.189***	0.114**	0.103**	0.121***
	(0.029)	(0.041)	(0.056)	(0.051)	(0.044)	(0.039)
N	33971	32821	31671	30521	29371	28221
***Panel 3**: Transportation*						
$\Delta log(Emp)$	-0.159	-0.100	0.147	0.380	0.545*	0.635**
	(0.199)	(0.235)	(0.309)	(0.255)	(0.290)	(0.277)
TEL $\times$ $\Delta log(Emp)$	-0.213	-1.682***	-1.481***	-0.435	0.132	0.188
	(0.212)	(0.431)	(0.428)	(0.336)	(0.208)	(0.375)
TEL	0.023*	0.095***	0.102***	0.089***	0.078***	0.081**
	(0.013)	(0.021)	(0.023)	(0.024)	(0.027)	(0.034)
N	34148	32998	31848	30698	29548	28398

Notes: Dependent variables are given by each panel heading. Units of all dependent variables are real, per-capita 2004 U.S. dollars. h represents the forecast horizon, as outlined in equation (2). TEL is an indicator taking value one if a city faces a general expenditure or general revenue TEL during the year in which the shock occurs. *Emp* is employment in the county in which a city resides. Municipality and year fixed effects omitted. Standard errors are clustered at the county level and presented in parentheses. Significance levels: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table 8 (Cont.): Baseline Results (Counties)

	$h = 0$	$h = 1$	$h = 2$	$h = 3$	$h = 4$	$h = 5$
Panel 4: *Public Maintenance*						
$\Delta log(Emp)$	-0.119	-0.135	0.001	-0.185	0.413	0.211
	(0.188)	(0.220)	(0.292)	(0.272)	(0.252)	(0.234)
TEL $\times$ $\Delta log(Emp)$	-0.403*	-0.950***	-0.735**	-0.171	0.151	-0.369
	(0.245)	(0.235)	(0.340)	(0.389)	(0.263)	(0.263)
TEL	0.048**	0.086***	0.091**	0.080**	0.087***	0.120***
	(0.022)	(0.030)	(0.040)	(0.039)	(0.033)	(0.033)
N	34132	32982	31832	30682	29532	28382
Panel 5: *Public Safety*						
$\Delta log(Emp)$	0.022	0.010	0.107	0.120	0.364***	0.085
	(0.111)	(0.133)	(0.136)	(0.134)	(0.120)	(0.112)
TEL $\times$ $\Delta log(Emp)$	0.115	-0.137	0.106	-0.056	-0.101	-0.131
	(0.162)	(0.321)	(0.329)	(0.148)	(0.141)	(0.162)
TEL	0.006	0.020	0.020	0.031*	0.039*	0.044**
	(0.010)	(0.016)	(0.015)	(0.016)	(0.021)	(0.020)
N	34137	32987	31837	30687	29537	28387
Panel 6: *Government Administration*						
$\Delta log(Emp)$	0.010	-0.113	0.276	0.360	0.466*	0.254
	(0.226)	(0.316)	(0.258)	(0.318)	(0.265)	(0.308)
TEL $\times$ $\Delta log(Emp)$	0.747**	0.787**	1.099**	-0.229	0.587	0.417
	(0.328)	(0.351)	(0.450)	(0.333)	(0.456)	(0.336)
TEL	-0.048**	-0.055*	-0.062*	-0.026	-0.055	-0.044
	(0.021)	(0.028)	(0.037)	(0.038)	(0.041)	(0.042)
N	34020	32870	31720	30570	29420	28270

Notes: Dependent variables are given by each panel heading. Units of all dependent variables are real, per-capita 2004 U.S. dollars. h represents the forecast horizon, as outlined in equation (2). TEL is an indicator taking value one if a city faces a general expenditure or general revenue TEL during the year in which the shock occurs. *Emp* is employment in the county in which a city resides. Municipality and year fixed effects omitted. Standard errors are clustered at the county level and presented in parentheses. Significance levels: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table 10: Baseline Results (Excluding Missing Data)

	$h = 0$	$h = 1$	$h = 2$	$h = 3$	$h = 4$	$h = 5$
Panel 1*: Expenditures*						
$\Delta log(Emp)$	-0.181	-0.019	-0.082	0.092	0.356*	0.707***
	(0.170)	(0.199)	(0.147)	(0.179)	(0.185)	(0.202)
TEL × $\Delta log(Emp)$	-0.030	-0.234	0.279	0.134	0.117	-0.063
	(0.145)	(0.215)	(0.176)	(0.265)	(0.212)	(0.283)
TEL	-0.000	0.019	0.019	0.033*	0.047**	0.056**
	(0.012)	(0.016)	(0.015)	(0.020)	(0.021)	(0.023)
N	13170	12731	12292	11853	11414	10975
Panel 2*: Capital Outlays*						
$\Delta log(Emp)$	-0.235	-0.864	-0.126	-0.163	0.168	1.815***
	(0.593)	(0.684)	(0.708)	(0.610)	(0.537)	(0.560)
TEL × $\Delta log(Emp)$	-1.626**	-2.047**	-1.399**	-0.375	0.374	0.275
	(0.793)	(0.902)	(0.638)	(0.839)	(0.482)	(1.005)
TEL	0.078**	0.139***	0.130**	0.127**	0.133**	0.125*
	(0.037)	(0.052)	(0.052)	(0.058)	(0.054)	(0.065)
N	13170	12731	12292	11853	11414	10975
Panel 3*: Transportation*						
$\Delta log(Emp)$	-0.450	-0.448	0.184	0.968***	0.451	0.706*
	(0.334)	(0.352)	(0.354)	(0.360)	(0.337)	(0.412)
TEL × $\Delta log(Emp)$	-0.301	-1.242*	-0.989**	-0.184	-0.638*	-0.014
	(0.385)	(0.664)	(0.462)	(0.288)	(0.384)	(0.380)
TEL	0.005	0.049	0.053	0.055*	0.083**	0.082**
	(0.022)	(0.032)	(0.032)	(0.030)	(0.036)	(0.034)
N	13170	12731	12292	11853	11414	10975

Notes: Regressions estimated on those municipalities without missing data in any spending category. Dependent variables are given by each panel heading. Units of all dependent variables are real, per-capita 2004 U.S. dollars. h represents the forecast horizon, as outlined in equation (2). TEL is an indicator taking value one if a city faces a general expenditure or general revenue TEL during the year in which the shock occurs. *Emp* is employment in the commuting zone in which a city resides. Municipality and year fixed effects omitted. Standard errors are clustered at the commuting zone level and presented in parentheses. Significance levels: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table 10 (Cont.): Baseline Results (Excluding Missing Data)

	$h = 0$	$h = 1$	$h = 2$	$h = 3$	$h = 4$	$h = 5$
***Panel 4**: Public Maintenance*						
$\Delta log(Emp)$	-0.328	-0.315	-0.447	-0.477	0.358	0.635*
	(0.347)	(0.344)	(0.403)	(0.465)	(0.367)	(0.350)
TEL $\times$ $\Delta log(Emp)$	-0.548	-1.148**	-0.507	-0.463	-0.587	-0.955
	(0.369)	(0.462)	(0.585)	(0.527)	(0.427)	(0.591)
TEL	0.036	0.076*	0.073	0.079	0.101**	0.138***
	(0.024)	(0.039)	(0.049)	(0.051)	(0.044)	(0.041)
N	13170	12731	12292	11853	11414	10975
***Panel 5**: Public Safety*						
$\Delta log(Emp)$	-0.006	0.084	0.234*	0.326**	0.515**	0.528***
	(0.130)	(0.126)	(0.127)	(0.160)	(0.211)	(0.188)
TEL $\times$ $\Delta log(Emp)$	0.091	0.059	0.239	0.180	-0.206	-0.339**
	(0.136)	(0.185)	(0.274)	(0.198)	(0.154)	(0.141)
TEL	-0.003	0.003	0.003	0.012	0.036*	0.040**
	(0.010)	(0.016)	(0.016)	(0.018)	(0.019)	(0.020)
N	13170	12731	12292	11853	11414	10975
***Panel 6**: Government Administration*						
$\Delta log(Emp)$	0.930**	0.657*	0.987***	0.664**	1.055***	1.088***
	(0.393)	(0.392)	(0.344)	(0.272)	(0.340)	(0.383)
TEL $\times$ $\Delta log(Emp)$	0.749*	0.528	1.158	0.450	0.499	0.719*
	(0.434)	(0.516)	(0.888)	(0.366)	(0.381)	(0.398)
TEL	-0.082*	-0.094	-0.132*	-0.114**	-0.105**	-0.101*
	(0.047)	(0.061)	(0.075)	(0.056)	(0.052)	(0.059)
N	13170	12731	12292	11853	11414	10975

Notes: Regressions estimated on those municipalities without missing data in any spending category. Dependent variables are given by each panel heading. Units of all dependent variables are real, per-capita 2004 U.S. dollars. h represents the forecast horizon, as outlined in equation (2). TEL is an indicator taking value one if a city faces a general expenditure or general revenue TEL during the year in which the shock occurs. *Emp* is employment in the commuting zone in which a city resides. Municipality and year fixed effects omitted. Standard errors are clustered at the commuting zone level and presented in parentheses. Significance levels: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.